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# A STUDY OF FACTORS INFLUENCING LEARNING IN MEDICAL STUDENTS

**Dr. Udaragudi Prasada Rao[1], Dr. Samson Sanjeeva Rao Nallapu[2*]**

*1. Assistant Professor, Dept. of Community Medicine, NRI Medical College, Chinakakani, Mangalagiri, Guntur District , AP State, India, 2. Professor, Dept. of Community Medicine, NRI Medical College, Chinakakani, Mangalagiri, Guntur District , AP State, India*

*Corresponding author - **Dr. Samson Sanjeeva Rao Nallapu**

Email id - samson.nallapu@yahoo.com

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**ABSTRACT**

**Background:** Adaptation of teaching methods according to students' learning manners is likely to improve their motivation and performance. Teachers are accountable to present educational content and skills in diverse ways in tune with the varying learning modes of their students. **Objective:** To identify factors influencing medical students' study routines and behaviors in a medical college from South India and to identify their learning style preferences. **Methods:** This cross-sectional study done at NRIMC, Guntur from July to September 2015, involved 282 medical students from the 5th and 7th semesters. A Likert type questionnaire enquired into factors like gender and semester differences and learning habits. Fleming's questionnaire on VARK (Visual, Aural, Read & Write and Kinesthetic) was used to identify learning styles. The findings were subjected to Chi square test at 5% level of significance. **Result:** Female students prefer to understand subject matter, (p 0.02) and desire academic achievement (p 0.014). Statistically significant factors affecting the 5th semester students (compared to 7th) include, teacher related factors (favoritism, personality, ability to inspire) and a gap between self appraisal and academic achievement, (p 0.0000003). Attitudes, peer pressure, assessment and feedback were seen to be important. As in other studies, almost half (49.3%) prefer a single style (unimodal). Learning style inclined significantly towards Kinesthetic. **Conclusion:** In addition to gender, many other factors play a significant role in learning. Learning experiences also differ between batches with the teacher playing an important role. As kinesthetic style is the preferred one in a majority of students, there is a need for less lecturing and more hands on experiences.

**Keywords:** medical student, study habits, VARK, learning styles, performance, attitudes

## INTRODUCTION

Teaching has been defined as building a bridge from the known to the unknown. Part of that bridge is to be able to understand the learners, the learning process, and understanding how knowledge is transported from textbooks, videos, and the various multimedia mediums to the learners. (1) Adaptation of teaching methods according to students' learning manners is likely to improve their motivation and performance. Teachers must be aware of the diversity of their students and to present content and skills in a variety of ways in order to accommodate all learners' preferences (2). In fact, understanding the learners, the learning process, and how knowledge is transmitted is a key facet of teaching. While students have the ability to learn in different ways, the methods of teaching must be appropriate to the students' preference. (3)

Many studies have used the VARK questionnaire to assess students' individual learning style preferences. These include visual (V; learning from graphs, charts,

and flow diagrams), aural (A; learning from speech), read-write (R; learning from reading and writing), and kinesthetic (K; learning from touch, hearing, smell, taste, and sight). (4) The VARK instrument is useful for teachers who seek to develop additional learning strategies for their classroom. (5)

This study is set to recognize the various factors that influence medical students' study habits, performance and attitudes. The study aims to list the various factors which play a role in the study habits of medical students and also to identify their learning styles with the help of the VARK questionnaire.

## MATERIALS & METHODS

This cross sectional study was done at the NRI Medical College in Andhra Pradesh during July to September 2015. The study involved 102 male and 182 female MBBS students from the 5th and 7th semesters (141each). After taking an informed consent, ensuring anonymity, a pretested questionnaire was administered. The questions centered on information related to study habits, teacher related issues, assessment, feedback, peer pressure, classroom behavior and computer based learning. The latest version of the VARK questionnaire (16 questions) was also used (with permission). (6) The students were allowed to choose multiple answers on the questionnaire and then the scoring algorithm for VARK was applied to the results in order to identify the modality preference of each student. The scoring algorithm for VARK was applied to the results. The data obtained was entered in MS office excel and analysed. The findings are presented in percentages and tables and subjected to tests of significance like Chi square test and Z test at 5% level of significance.

## RESULTS

Students have many customs regarding their studying. Some of them are; needing a special place or a special time to study, needing absolute quietness; reading aloud, having the study material read to them or having combined study with a friend (Table 1). Female students preferred not to learn by heart (p 0.02), wanted more than passing marks (p 0.014), a favorite place to study, (p 0.015) and felt that teacher characteristics were important (p 0.049).

Significant differences between 5th and 7th semester were; favoritism by teachers,(p0.00017), inspiration from teachers, (p 0.00037), teacher characteristics, (p 0.0000002), expectation and achievement gap, (p 0.0000003).

VARK revealed that 49.3% of the students were unimodal preferring a single style. 18.8% were Bimodal and 31.9% Multimodal. Difference in sexes regarding learning style modality was not statistically significant. Overall 52.8% of the students were kinesthetic, 30.5 % aural, 9.9 % visual and 6.7 % Read and Write. 75.5% males and 54% females preferred the kinesthetic style of learning (p 0.01). Among those who preferred auditory mode, female students were found to be more (80%) while of the male students, 56.5% were more towards kinesthetic style of learning (p value 0.02).

Comparing self perception of students concerning their academic capability and their performance, it is seen that there was no disparity in 63.1% of them. 27.0% did poorly than their estimate and 9.9% did better. There was no gender difference in this regard. However comparing year of study, it is seen that the Semester 7 students matched better in self perception and actual performance (73.8%) while semester 5 students it was 52.5% (, p 0.0002). 41.1% of Semester 5 students did worse than their self perception while only 12.8% of Semester 7 did worse (, p 0.0000001).

82% of the students said that their studying involves nil to less than 25% usage of computers. 37.6% said that they have never downloaded any academic material from the internet (Table 5). However 94.7% of the students said that the internet was necessary for study. The female students felt its need more (p 0.01). While it is seen that students on an average spent 1 hour per day on academic work, they spent at least 3.6 hours on entertainment, general knowledge and other non academic activity (Males 4.0 hours, females 3.23 hours, p value 0.006).

## DISCUSSION

The factors looked at in this study are student habits, their attitudes, teacher characteristics, assessment, classroom behaviour, computer use and learning styles. Student attitudes vary; some preferring to study just before exams, some aiming for just passing marks and some preferring text books to class notes. It was seen that many students considered themselves as average academically. It is important to note that a good number of students had a good self perception of their academic capability. Only a quarter of the students performed lesser than they had expected.

The study shows that teachers do play a role in students' interest to learn by their mannerisms, their special characteristics and some amount of favoritism among students. Some teachers do inspire their students to do well. Assessment and feedback is a powerful tool to help students increase their efforts. Peer pressure also plays an important role in classroom behaviour and learning. The study shows that the learning experiences and other aspects of the learning environment vary significantly between each batch of medical students.

The female students are more motivated and have definite study habits. They are also more influenced by their teachers' mannerisms and ways. The auditory style of learning was more prevalent among the female students while the kinesthetic style in the male students.

Kumar et al in a study on 208 third and fourth year medical students (104 males and 104 females) suggest that there are no differences in learning styles between sexes. (3) However they suggest that awareness and consideration of VARK helps encourage teachers to respect the diversity of learners. The findings of another study by Bernardes and Hanna concluded that the majority of the management students in their study appeared to be multimodal, utilizing multiple channels to encode and interpret information. The findings of the study also concluded that males appeared more likely to have a single modality preference versus the female students. (7)

In a study by Alexandra and Georgetta, 34 students were investigated from across the United States, representing a diversity of backgrounds. Out of the students queried, 19 persons (56%) had a multimodal preference. The kinesthetic (K) learning style was seen in 46% of the subjects making it the dominant learning style. (1) The study supports the importance of students identifying their learning style preference in order to aid in their individual learning processes.

James, D'Amore and Thomas found that the average score for aural was the lowest and for kinesthetic learning, it was the highest. (8) The significant preference by many students for kinesthetic compared to visual, aural and read – write shows the need for a teaching style that is more hands on. This would involve more practical work, interactive simulations and role plays which engage all the senses in learning. In many studies, aural scores seem to be the least common. Traditional lectures may therefore not be ideal for teaching methods for the best learning outcomes.

Having an awareness of the learning styles and considering their impact on learning environments are first steps toward a vital understanding of our students and creating an effective learner analysis that will inform design decisions throughout the development and carrying out of a course (9).With a prior knowledge of various learning strategies, students were encouraged to incorporate a combination of learning strategies which best suits them. However teachers should make a conscious effort to let the students explore other learning styles as well. (10)

As seen in our study, Urval et al in their study also reported that a good number of students had multiple learning preferences. However aural (45.5%) and kinesthetic (33.1%) were the major modalities in the cited study. Contrary to other studies, factor like gender or academic performance had no influence on learning styles. (11) Almigbal et al, in their study, found that there was no significant relationship between learning style preference and academic achievement. (12)

In this study, medical students said that they were spending an average of 4 to 5 hours a day on using computers for entertainment, general knowledge and academics. However there seems to be more time spent on non academic activities on the internet. General computer skills were average in all students while all seem to be adept at browsing.

## CONCLUSION

Medical teachers must recognize that differences exist among their students with respect to their assorted styles of learning. They must therefore be prepared to teach their topic in a range of methods. This study highlights the Kinesthetic and Aural styles as preferred learning styles of the participants. According to results of this study students need different methods to educate themselves. It is better for both teachers and students to try different methods of learning. Though computer use is necessary for today's learning, students may be easily distracted. Counseling on disciplined use of this tool for education is essential.

**Limitation:** The study did not account for demographic factors such as socioeconomic status, race, culture, etc.

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**Conflicts of Interest:** The authors declare that they have no conflict of interest.

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| S.No | Table 1 – Study habits in Medical students | % (n=282) |
|---|---|---|
| 1 | Need for Internet to study | 94.7 |
| 2 | Need for doing something practical | 91.1 |
| 3 | Need for a favorite place to study | 86.2 |
| 4 | Need to write notes while studying | 84.8 |
| 5 | Need for combined study with a friend | 76.6 |
| 6 | Need for absolute quiet when studying | 75.5 |
| 7 | Need for a favorite time of study | 66.0 |
| 8 | Need to read aloud | 51.1 |
| 9 | Need to hear someone read aloud from the book | 31.6 |
| 10 | Need to listen to music when studying | 26.6 |

| S.No | Table 2 - Attitude towards learning | % (n=282) |
|---|---|---|
| 1 | A practical demonstration in class is important | 97.9 |
| 2 | Doctor must have concern, compassion and public mindedness | 97.9 |
| 3 | Examples and illustrations during class are more helpful | 96.1 |
| 4 | Just passing marks is fine | 29.4 |
| 5 | Text books preempt need to pay attention in class | 24.5 |
| 6 | Studying just before exam is sufficient | 22.0 |
| 7 | Learning by heart is better than understanding | 19.5 |

| S.No | Table 3 - Teacher factors affecting learning (n=282) | % (n=282) |
|---|---|---|
| 1 | Teacher's mannerisms and behaviour | 91.8 |
| 2 | Teacher's good characteristics | 51.4 |
| 3 | Teacher's favoritism in class | 34.8 |
| 4 | Teacher is a source of inspiration | 62.1 |
| 5 | Teacher not knowing students' names is troubling | 57.1 |

| S.No | Table 4 - Assessment, Feedback, Classroom behaviour | % (n=282) |
|---|---|---|
| 1 | Need to participate in class & ask doubts etc. | 85.1 |
| 2 | Need for some feedback on performance | 80.5 |
| 3 | Average in all subjects is better than excellent in few | 70.6 |
| 4 | Current methods of performance assessment is satisfactory | 62.1 |
| 5 | By standing out we risk ridicule by class mates | 55.0 |
| 6 | Need to be seen as a good student by classmates | 53.9 |
| 7 | Marks obtained by us are as deserved | 50.7 |
| 8 | Answer paper grading is satisfactory | 48.9 |

| S.No | Table 5 - Computer access and skills | % (n=282) |
|---|---|---|
| 1 | Nil or poor computer skills (MS word, excel etc) | 41.1 |
| 2 | Nil or poor browsing skills | 14.5 |
| 3 | No free and convenient access to internet | 63.5 |
| 4 | Do not own laptop / desktop with internet | 42.2 |
| 5 | Have never downloaded academic material | 37.6 |
| 6 | Nil to < 25% of study involves computer | 81.2 |

| S.No | Table 6 - Computer usage | Men | | Women | | p value |
|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | |
| 1 | Mean hours spent on entertainment each day | 2.8 | 2.24 | 2.46 | 1.86 | 0.17 |
| 2 | Mean hours spent on academic work each day | 1.05 | 1.32 | 1 | 0.83 | 0.69 |
| 3 | Mean hours spent on non academic internet use each day | 1.19 | 1.27 | 0.76 | 0.66 | 0.0002** |
| | Total | **5.04** | | **4.22** | | |

**** Highly significant**

**Table 7 – Student learning style preferences between genders**

| Unimodal (n=139) | Male (%) | Female (%) | Total % | Chi Square | P value |
|---|---|---|---|---|---|
| Visual | 9.4 | 4.7 | 6.5 | 0.63 | 0.4 |
| Aural | 13.2 | 34.9 | 26.6 | 7.89 | 0.005** |
| Read & Write | 1.9 | 5.8 | 4.3 | 1.22 | 0.3 |
| Kinesthetic | 75.5 | 54.7 | 62.6 | 6.07 | 0.01* |

*** significant, ** highly significant**